

Options **For Success**



*Meeting water system
challenges through water-use
efficiency programs*

Meeting The Efficiency Challenge

Water is an increasingly valuable commodity that is essential for healthy communities. Many water systems implement water efficiency (conservation) measures as cost-effective options to developing new sources or building new infrastructure when faced with supply, demand, delivery or operational challenges. The successes of three water systems in addressing these challenges are detailed in this report.

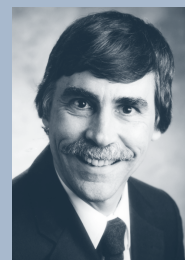
Meeting Water System Needs

Respondents to a Department of Health survey of 477 small and medium water systems, conducted in May 2000, indicated strong interest in learning more about successful water conservation programs. This publication addresses the need for that information, and complements Department of Health conservation fact sheets and other technical assistance tools.



Our state is facing increasing, and often competing, demands for drinking water. The threat of water shortages affecting much of Washington State makes water

use an even more critical issue.



The efficient use of water provides many benefits to water systems and their customers,

including preservation or expansion of water system capacity – the ability to reliably serve existing and future customers with adequate amounts of clean, safe drinking water.

Providing water system managers with information about how to use water efficiently is a priority for the Department of Health. The examples contained in *Options For Success* illustrate how three water systems successfully met various challenges through specific, focused efforts. Whether facing a crisis situation or taking steps to avoid one, using water efficiently makes sense.

A handwritten signature in black ink, reading 'Gregg Grunenfelder'.

Gregg Grunenfelder
Director, Division of Drinking Water

**It's Worth
Saving**
Drinking Water



Preserving Coupeville's Future By Saving Water Today

Crisis situations often require dramatic solutions. In the 1980s the Town of Coupeville on Whidbey Island faced summer demands that drained the town's sole reservoir.

Water supply modeling showed that the town's wells and reservoirs were near capacity, and the threat of saltwater intrusion into wells was looming. Sufficient funds were not available to make necessary system improvements.

Several times during the late '80s the town had to limit new connections in an attempt to preserve capacity of the then rapidly growing area. Finally in 1992 town leaders took steps that may have risked their political futures, but preserved the future of the water system – and overall water consumption dropped 16 percent in one year.

"We've taken a variety of steps to decrease consumption...It's been hard, but we're going to do it right. Twenty years from now I don't want somebody to have to pick up the pieces of what we didn't do."

**- Mayor Nancy Conard,
Town of Coupeville**

"The biggest issue and the most effective technique to reduce demand was rates," says Mayor Nancy Conard, who joined the town council in 1992. "There's a big drop in consumption when you pay more."

Challenge:

Water shortages

Methods:

Reduce water use by using a tiered rate structure/summer surcharge, educating customers and offering rebates on water-efficient toilets

Results:

Consumption per connection decreased 16 percent in year following rate change

Coupeville's new rate structure included a 47 percent increase in the consumption charge and a 50 percent summer surcharge. The new rates also included a 111 percent increase in the base service charge to fund operating costs and capital improvements, something that previously had not been adequately funded. "The system had not been very well maintained and the rates helped address that," says Conard.

The tiered or "conservation" rate structure features a monthly service charge and reserve capacity charge based on the size of the meter – a standard residential meter is \$13.33 per month. Winter (October through May) consumption charges are \$2.75 per 100 cubic feet, while customers pay \$4.12 per 100 cubic feet from June through September. A 1992 study by the City Engineers Association of Washington showed Coupeville's rates as among the highest in Washington State.

The town also offered customers a \$200 rebate on the installation of ultra-low flush toilets to further reduce demand for the island's precious resource – and the response was overwhelming. "People felt like the town was participating in the solution to the problem," Conard says. "Demonstrating credibility and continual education are the key to successful changes over time regarding our water conservation program," she adds.

A leak detection program and other internal efforts – including meter testing and tightened accounting procedures – have resulted in Coupeville's unaccounted-for water hovering near 8 percent, well below Department of Health standards.

The changes in Coupeville have not been easy, but they have been effective. In 1991, the year before the new rate structure, per connection usage was 346 gallons per day. The next year usage dropped to 289 gallons per connection for a 16 percent decrease. Today per connection usage is 245 gallon per days, nearly 30 percent less than a decade ago.

"We've taken a variety of steps to decrease consumption," says Conard, who helped make the politically tough decisions in the early '90s. "It's been hard, but we're going to do it right. Twenty years from now I don't want somebody to have to pick up the pieces of what we didn't do."



Public Works Director Malcolm Bishop and Mayor Nancy Conard review production figures at the Town of Coupeville's water treatment plant. Per connection water consumption in Coupeville is 30 percent less than a decade ago, due to a consumption-oriented rate structure and other conservation measures.

Water Lines, New Rates Yield Efficiency Improvements

Sometimes convincing customers and elected officials of the need to reduce unaccounted-for water can be frustratingly difficult, especially when the solution involves a rate increase. Other times, the simple facts present a compelling case for immediate action.

In the early 1990s the City of Entiat, which is located north of Wenatchee, discovered its two source pumps were running up to 23 hours per day, racking up annual electrical bills of around \$9,000. Engineers estimated that up to 75 percent of the nearly 1 million gallons per day pumped from a well field near the Columbia River was disappearing into the area's sandy, rocky soil.

"We explained to the mayor and city council about the amount of water we were losing and our electricity costs," says Bob Whitehall, maintenance superintendent. "We also took it to public meetings, and based on the response we decided to do it all at once."



The replacement of about seven miles of water lines in 1994 and other efficiency measures helped reduce the City of Entiat's water loss to about 2 percent, down from about 75 percent. In addition, pumping costs declined about 86 percent.

"If you show (customers) they're throwing money away, they understand the need for higher rates."

**- Bob Whitehall,
maintenance superintendent,
City of Entiat**

'Doing it all' meant replacing about seven miles of Entiat's 11.5 miles of water line and building an additional reservoir to serve the city's more than 300 customers. The \$2 million project, started in 1994, was financed with a 40-year, low-interest loan from the Farmer's Home Administration (now the U.S.D.A. Rural Utilities Service) and grants.

One requirement for the 5.1 percent loan was demonstrated ability to meet the payback schedule. To that end, Entiat boosted its base monthly service charge for water from \$12 to \$32.59 for the first 8,000 gallons of water. Additional consumption was billed at \$1 per 1,000 gallons. "If you show them (customers) they're throwing money away, they understand the need for higher rates," he says.

The increase covers the payment schedule but also prompts customers to conserve water, Whitehall says.

At about the time the excessive pumping became apparent, Entiat also implemented a customer conservation outreach campaign. "We had to do as much as we could to start conserving," Whitehall says.

Efforts have included distributing information on leak detection, water-efficient toilets and other conservation techniques to customers. The results of those efforts have been surprising, Whitehall says. He estimated that about one-third of the older residences in town

have installed low-flush toilets (newer residences are subject to the state requirement for low-flush toilets). To further tighten its system, Entiat recently completed a system-wide meter replacement project.

Challenge:

Unaccounted-for water

Methods:

Reduce water loss and water use by replacing pipes and using a tiered rate structure

Results:

Water loss reduced 73 percent

The results of Entiat's multi-faceted efforts to improve water-use efficiency are dramatic. Today the system's water loss is about 2 percent, down from the 75 percent of just a few years ago. Electricity to run the city's pumps now costs

about \$1,200 per year, a whopping 86 percent reduction over the 1993 charges of \$9,000.

Getting a Handle On Consumption

In 1996 Scott Lake Maintenance Company – a non-profit neighborhood association serving a community of about 555 homes in south Thurston County – was at a crossroads.

Several issues had prompted the board of directors to reassess the system's management. With the help of the Washington State Department of Health and an engineering consultant, Scott Lake set out to develop a Water System Plan. What the association subsequently learned was even more troubling: system uses exceeded water right limits.

"We realized we needed to get a handle on consumption," says Mike Willis, executive secretary of the maintenance company.

Although most of the homes had been metered for 15 years, the meters were never read, and billing was based on a flat quarterly rate. There was still significant opposition to meter reading. "The residents disagreed amongst themselves, but we finally came around to reading the meters," Willis says.

First, the maintenance company replaced defective or non-functioning meters, and then located and helped residents repair "out-of-control" leaks. That work was accomplished within the system's operating budget. Next a new, tiered rate structure was established. Customers are charged \$27 every two months for up to 1800 cubic feet (about 224 gallons per day) of water. Additional consumption (up to 1000 cubic feet) is billed at 75 cents per 100 cubic feet, and consumption above 2800 cubic feet is billed at \$1 per 100 cubic feet.

In February 1999 Scott Lake hired a resident to read service meters and keep track of unusual water consumption (as an indica-

tor of leaks). Maintenance of the system is handled through a contract with Washington Water Service, and with the help of many volunteers.

"There's been a real clear drop in outside watering since meter reading began," says Willis. "Some residents were rather cross with us about it, but we've gone through two summers now and I think they're getting used to it."

The results have been dramatic. In 1996 when the system's troubles were first revealed, water used averaged 443 gallons per day per connection. Last year, per connection water use averaged 227 gallons per day, a nearly 50 percent decline per connection and essentially the

same volume as that provided by the base service rate. About 10 percent of that reduction can be attributed to leak repair, Willis says.

Scott Lake also has taken steps to improve the financial management of the system.

The association sets aside 20 percent of revenues to pay for unexpected repairs and improvements. In addition, residents are assessed another \$10 per month to fund a reserve account to finance replacement of the 30-year-old system of the system as needed.

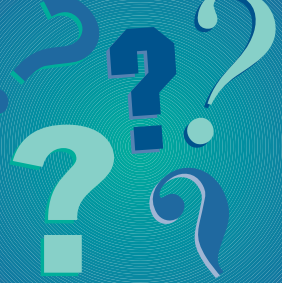
"Our feeling was that the water system was really straining because of water consumption – pumps burning out, almost overuse of some facilities. Questions about reservoir storage, obvious overuse of water for irrigation by some residents, and wear and tear on equipment were issues that brought water system management to the board's attention," Willis says. "It's really been an effort to re-think the management of the system."



Regular meter reading is a big part of the Scott Lake Maintenance Company's success in improving efficiency. Volunteers such as Paul Eddy, a board member and chairman of the water committee, help out.

"There's been a real clear drop in outside watering since meter reading began. Some residents were rather cross with us about it, but we've gone through two summers now and I think they're getting used to it."

**- Mike Willis,
Scott Lake Maintenance Company**



Additional Information

American Water Works Association

6666 West Quincy Ave.,
Denver, CO 80235
303-794-7711

www.awwa.org

www.waterwiser.org

The American Water Works Association provides a variety of publications and programs for water system operators. The WaterWiser web site (www.waterwiser.org) serves as a clearinghouse of water efficiency information.

Evergreen Rural Water of Washington

510 N. Pine Street,
Ellensburg, Washington 98826
509-962-6326

www.erwow.org

Evergreen Rural Water of Washington is a non-profit organization representing small water and wastewater systems in Washington State that offers a variety of training programs, and technical and financial assistance information.

National Drinking Water Clearinghouse

Western Virginia University
PO Box 6064,
Morgantown, WV 26506-6064
800-624-8301

www.ndwc.wvu.edu

The National Drinking Water Clearinghouse assists small communities by collecting, developing, and providing timely information relevant to drinking water issues.

Where To Get Information

The Division of Drinking Water helps water systems develop and implement water efficiency programs by providing assistance in finding technical and financial resources. For more information, contact your regional water conservation specialist.

Northwest Regional Office – 253-395-6769

Eastern Regional Office – 509-456-5067

Southwest Regional Office – 360-664-2543

Information On the Web

Water use efficiency information is also available online at www.doh.wa.gov/ehp/dw under purveyor assistance.

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Rural Community Assistance Corporation

4305 Lacey Blvd. SE,
Lacey, WA 98503
360-493-2260

www.rcac.org

Rural Community Assistance Corporation provides training and technical assistance to small and rural municipal water/wastewater facilities.

U.S. Environmental Protection Agency

Water Efficiency Program (4204M)
1200 Pennsylvania Avenue, NW,
Washington, DC 20460

202-564-0623 or 202-564-0624

www.epa.gov/owm/genwave.htm

The Water Efficiency program offers a broad range of water efficiency information and publications.

